

WHAT IS CLAIMED IS:

1. A disc balancing device which balances a disc comprising:
 - a disc assembly having a driving source, wherein the disc is rotatably disposed at the driving source;
 - a displacement measurement unit measuring vibration in the rotation of the disc assembly;
 - a phase angle measurement unit measuring a phase angle from a reference point of the disc assembly in the rotation of the disc assembly;
 - an operation/control unit calculating an eccentric mass and an eccentric position of the disc assembly, by using the biased vibration measured in the displacement measurement unit and the phase angle measured in the phase angle measurement unit; and
 - a laser cutter tracking and laser-cutting a side portion of the disc corresponding to the eccentric position according to the eccentric mass information from the operation/control unit, wherein the eccentric mass of the disc assembly is balanced to reduce vibration in the rotation.
2. The device according to claim 1, further comprising a dust inhaler inhaling dust generated when the side portion of the disc is cut by the laser cutter.
3. The device according to claim 2, wherein the dust inhaler and the laser cutter are moved by a robot unit controlled by the operation/control unit, tracking the eccentric position.
4. The device according to claim 1, wherein the phase angle measurement unit is a photo sensor measuring the phase angle by irradiating light to the reference point and receiving a reflection light from the disc assembly.
5. A method of balancing a disc to reduce vibration due to an eccentric mass of the disc in the rotation of the disc rotatably disposed at a driving source, the method comprising:
 - preparing a disc assembly having the driving source and the disc;
 - rotating the disc assembly, and simultaneously measuring an initial vibration due to the eccentric mass of the disc assembly;
 - measuring a phase angle from a reference point of the rotated disc assembly;
 - calculating the eccentric mass and position of the disc assembly according to the initial vibration and phase angle; and

cutting a side portion of the disc corresponding to the eccentric position according to the calculated eccentric mass.

6. The method according to claim 5, further comprising inhaling dust generated when the side portion of the disc is cut.

7. The method according to claim 5, further comprising :
re-measuring vibration of the disc assembly after the cutting; and
comparing the re-measured vibration with a reference value, wherein, if the re-measured vibration is greater than the reference value, repeating the rotating, measuring, calculating and cutting until the re-measured vibration is smaller than the reference value.

8. The method according to claim 5, further comprising moving a laser cutter] by a robot unit controlled by an operation/control unit, to cut the side portion.

9. The method according to claim 6, further comprising moving a dust inhaler by a robot unit controlled by an operation/control unit, to inhale the dust.

10. A method for balancing a disc comprising:
simultaneously rotating and measuring the vibration of a disc due to an eccentric mass thereof;
measuring a phase angle position of the eccentric mass;
calculating the eccentric mass and position on the disc according to the measured vibration and phase angle; and
cutting a portion of the disc based upon the calculated eccentric mass and position.

11. The method of claim 9, further comprising inhaling dust generating during the cutting.

12. The method of claim 9, wherein the measuring the vibration is repeated after the cutting, and if the measured vibration is greater than a predetermined value, the method further comprises repeating simultaneously the rotating and measuring the vibration, the measuring the phase angle, the calculating, and the cutting until the measured vibration is smaller than the predetermined value.

13. A method for balancing a disc comprising:
rotating the disc;
measuring the location of an eccentric portion of the disc; and
cutting a portion of the disc measured during rotation of the disc.
14. A disc balancing device comprising:
a disc assembly having a driving source and at least one disc rotatably disposed at the driving source;
a measurement unit measuring an eccentric portion of the at least one disc; and
a laser cutter cutting the measured eccentric portion.
15. The device according to claim 14, wherein:
a plurality of discs are rotatably disposed at the driving source;
the measurement unit measures an eccentric portion of the discs; and
the laser cutter cuts the measured eccentric portion.
16. The device according to claim 1, wherein the device balances a plurality of discs,
wherein:
the discs are rotatably disposed at the driving source; and
the laser cutter tracks and laser-cuts side portions of the discs corresponding to the eccentric position according to the eccentric mass information from the operation/control unit,
wherein the eccentric mass of the disc assembly is balanced to reduce vibration in the rotation.